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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/605,906	11/05/2003	An L. Steegen	FIS920030236US1	2905

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Reston, VA 20191

EXAMINER
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SMOOT, STEPHEN W

ART UNIT	PAPER NUMBER
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2813

DATE MAILED: 03/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	Application No. 10/605,906	Applicant(s) STEEGEN ET AL.	
	Examiner Stephen W. Smoot	Art Unit 2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 December 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-23 and 37 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-18 and 37 is/are allowed.
- 6) ☒ Claim(s) 19, 22 and 23 is/are rejected.
- 7) ☒ Claim(s) 20 and 21 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>2-9-06</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

This Office action is in response to applicant's amendment received on 20 December 2005.

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 19, 22-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Lee et al. (US 6,825,086 B2).

Referring to Figs. 1-4, 9, 11 and column 2, line 46 to column 5, line 50, Lee et al. disclose a method for forming a strained channel CMOS device that includes the following features:

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- A silicon wafer (102) is provided that can be doped either n-type or p-type (see column 2, lines 49-51);
- A silicon-germanium epitaxial layer (104) is grown on the wafer (102) as an initially strained layer (see column 2, lines 52-54);
- A silicon layer (108) is grown on the silicon-germanium epitaxial layer (104) (see column 2, lines 58-60);
- A trench (300) is formed by etching through the silicon layer (108) and the silicon-germanium epitaxial layer (104) to the wafer (102) (see column 3, lines 4-5);
- The trench (100) is lined with a silicon oxide liner (400) (see column 3, lines 22-24);
- NMOS and PMOS transistors are formed on the substrate as shown in Fig. 9 (see column 3, lines 43-48); and
- Regarding claim 22, the silicon oxide liner (400) is not located under the PMOS transistor.

These are all of the process limitations as set forth in claims 19, 22-23 of the applicant's invention. Regarding the growing a strain layer in the gap limitation of applicant's independent claim 19, this is a functional limitation that is presumed to be inherent to the above method of Lee et al. because their method is substantially identical to the applicant's method as claimed in claims 19, 22-23. Accordingly, per MPEP section 2112.01, the burden now shifts to the applicant to show that their as claimed method is different.

***Allowable Subject Matter***

3. Claims 1-18, 37 are allowed.
4. Claims 20-21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form to include all of the limitations of the base claim and any intervening claims.
5. The following is a statement of reasons for the indication of allowable subject matter:
  - Claims 1-18, 37 are allowed because the prior art of record does not teach or suggest, in combination with the other claim limitations, a method for manufacturing a device that includes forming a gap in a semiconductor substrate, depositing a spacer material over portions of the gap, and growing a strain layer in at least a portion of the gap;
  - Claims 20-21 would be allowable because the prior art of record does not teach or suggest, in combination with the other claim limitations, a method for manufacturing a device that includes forming a gap between a semiconductor substrate and a silicon layer by removing at least a portion of the silicon layer and an underlying first strain layer and growing a second strain layer in the gap, wherein the second strain layer is substantially directly under a channel of an n-

type device (claim 20), or wherein the second strain layer is substantially directly under at least one of a source region or drain region of a p-type device (claim 21).

### ***Response to Arguments***

6. Applicant's arguments received 20 December 2005 regarding the above prior art rejection based on Lee et al. (US 6,825,086 B2) (see pages 11-13) have been fully considered but they are not persuasive.

The applicant argues that a gap is not the same as a trench. This argument is not persuasive because per MPEP section 2111, "claims must be given their broadest reasonable interpretation" and, accordingly, it is not unreasonable to conclude that the applicant's "gap" as used in claim 19 can be interpreted to be a trench as described by Lee et al. (US 6,825,086 B2). That is, gaps and trenches are openings formed in substrate surfaces.

The applicant further argues that Lee et al. (US 6,825,086 B2) lack the limitation of growing a strain layer in the gap. However, Lee et al. (US 6,825,086 B2) teach the formation of a silicon oxide liner layer (400) in the trench and the applicant's dependent claim 23 indicates that the strain layer can be silicon dioxide. Accordingly, per MPEP section 2112.01, a *prima facie* case of anticipation has been established regarding the capability of the silicon oxide liner of Lee et al. (US 6,825,086 B2) to function as a strain layer and the burden has been shifted to the applicant to show that their process as

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claimed in claims 19, 22-23 is different from the prior art of Lee et al. (US 6,825,086 B2).

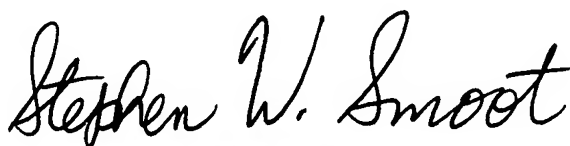
### ***Conclusion***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen W. Smoot whose telephone number is 571-272-1698. The examiner can normally be reached on M-F (8:00 am to 4:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SWS



**STEPHEN W. SMOOT  
PRIMARY EXAMINER**